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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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CANTOR COLBURN LLP - IBM FISHKILL
20 Church Street
22nd Floor
Hartford, CT 06103

EXAMINER	
ROMAN, LUIS ENRIQUE	
ART UNIT	PAPER NUMBER
2836	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/710,653	BAIN ET AL.	
	Examiner	Art Unit	
	Luis Roman	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/05/07 has been entered.

Accordingly claims 2-5, 7-11 & 15-18 have been kept original, claims 1, 6 & 14 have been amended, claims 12-13 & 19 have been previously presented and claim 20 has been cancelled. No new claims were added. It also included remarks/arguments.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kawakami et al. (US 5542559) in view of Lee et al. (US 7040525).

Regarding claim 1 Kawakami et al. discloses an electrostatic chuck (F.1) with a plurality of gas channels (54), a bi-directional backside conduit (5, 5A, 5B) in communication with a gas supply (56) and a vacuum (57) but does not specifically disclose wherein the plurality of gas channels are configured to facilitate vacuum assisted chucking of a wafer retained on said electrostatic chucking pedestal

during which vacuum assisted chucking an electrostatic chuckling voltage remains applied to the electrostatic chuckling pedestal, wherein the vacuum assisted chucking is implemented prior to performing a wafer processing operation for which the wafer is chucked.

Lee et al. teaches a device which applies a n electrostatic force and a vacuum force to hold a substrate to perform work on it (Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kawakami et al. device with the Lee et al. teachings because it allows smoother and quicker processes of a work piece (C. 4 l. 4-8).

Regarding claim 2 Kawakami et al. in view of Lee et al. discloses the apparatus of claim 1.

Kawakami et al. further discloses comprising means for selectively coupling to one of said backside said bi-directional backside conduit carrier gas supply line and said vacuum supply line (F.1 e.V1 & V2).

Claims 3-4 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kawakami et al. (US 5542559) in view of Lee et al. (US 7040525) and Deguchi et al. (US 5665166).

Regarding claim 3 Kawakami et al. in view of Lee et al. discloses the apparatus of claim 2.

Kawakami et al. in view of Lee et al. does not disclose further comprising detection circuitry for detecting a curvature present in a wafer placed on said chucking pedestal.

Deguchi et al. teaches further comprising detection circuitry for detecting a curvature present in a wafer placed on said chucking pedestal (C.11 l.55 to C.12 l.14, C.4 l.28-33 & F.10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kawakami et al. in view of Lee et al. device with the detection circuitry of Deguchi et al. since Kawakami et al. in view of Lee et al. controls the pressure of the gas (temperature in the wafer) to address differences in the thickness of the wafer, while Deguchi et al. incorporates a circuitry to sense current thru the electrodes to determine the deviation on the surface of the wafer; which means that the detection/measurement and calculation/control a posteriori results easier and more accurate by working with current values instead of temperature ones.

Regarding claim 4 Kawakami et al. in view of in view of Lee et al. and Deguchi et al. discloses the apparatus of claim 3.

Kawakami et al. further discloses wherein said detection circuitry is configured to cause said bi-directional backside conduit to be decoupled from said backside carrier gas supply line and coupled to said vacuum supply line upon a detection of an area of contact area in said wafer (C.10 l.1-29).

Kawakami et al. in view of Lee et al. does not specifically disclose where that detection is based on the curvature of the wafer.

Deguchi et al. teaches further comprising detection circuitry for detecting a curvature present in a wafer placed on said chucking pedestal (C.11 l.55 to C.12 l.14, C.4 l.28-33 & F.10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kawakami et al. in view of Lee et al. device with the detection circuitry of Deguchi et al. since the apparatus of Kawakami et al. in view of Lee et al. needs flat wafers to work to measure accurately the area of contact between wafer and base of the electrostatic chuck. Moreover having a detection of the curvature will help in determining the exact shape of the wafer and based on this operate the cooling gas system.

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kawakami et al. (US 5542559) in view of Lee et al. (US 7040525), Deguchi et al. (US 5665166) and Kellerman et al. (US 7033443).

Regarding claim 5 Kawakami et al. in view of Lee et al. and Deguchi et al. discloses the apparatus of claim 4.

Kawakami et al. in view of Lee et al. and Deguchi et al. does not disclose detection circuitry is further configured to cause said bi-directional backside conduit to be decoupled from said vacuum supply line and re-coupled to said backside carrier gas supply line upon detecting a desired pressure between said wafer and said chucking pedestal

Kellerman et al. further discloses wherein said detection circuitry is further configured to cause said bi-directional backside conduit to be decoupled from said vacuum supply line and re-coupled to said backside carrier gas supply line upon detecting a desired pressure between said wafer and said chucking pedestal (C.14 l.4-19) <sensing/detection: Deguchi et al. device and calculation/controlling: Kellerman et al. device>).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kawakami et al. in view of Lee et al. and Deguchi et al. device with the controlling device of Kellerman et al. because this controlling advantageously controls an amount of thermal conduction through the cooling gas (C.14 l.8-10).

Claims 6-7 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kawakami et al. (US 5542559) in view of Kellerman et al. (US 7033443) and Lee et al. (US 6974709).

Regarding claim 6, Kawakami et al. discloses an electrostatic chuck (F.1) with a bi-directional backside conduit (5, 5A, 5B) in communication with a gas supply (56) and a vacuum (57).

Kawakami further discloses a plurality of gas channels formed thru a top surface (23) in fluid communication with the backside conduit (both conduits are in communication with the same chamber).

Kawakami et al. does not either disclose wherein the pedestal has an inner and outer zones each having a top surface beneath the wafer, wherein the zones are mechanically decoupled from one another such the top surface of the outer zone is capable of selective adjustment of both above and below of the top surface of the inner zone nor that the vacuum chucking is implemented before the processing of the wafer.

.Kellerman et al. teaches wherein the pedestal has an inner and outer zones each having a top surface beneath the wafer, wherein the zones are mechanically decoupled from one another such the top surface of the outer zone is capable of selective adjustment of both above and below of the top surface of the inner zone (C.11 l.50 to C.12 l.13).

Lee et al. teaches a device which applies a n electrostatic force and a vacuum force to hold a substrate to perform work on it (Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kawakami et al. device with the inner an outer zones of Kellerman et al. device because it permits the clamping plate to be referenced to a surface flatness of the substrate (C.12 l.10-13) and further in view of Lee et al. teachings because it allows smoother and quicker processes of a work piece (Col. 4 lines 4-8).

Regarding claim 7 Kawakami et al. further discloses comprising means for selectively coupling said bi-directional backside conduit to one of said backside carrier gas supply line and said vacuum supply line (F.1 e.V1 & V2).

Claims 8-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kawakami et al. (US 5542559) in view of Kellerman et al. (US 7033443), Lee et al. (US 7040525) and Deguchi et al. (US 5665166).

Regarding claim 8 Kawakami et al. in view of Kellerman et al. and Lee et al. discloses the apparatus of claim 7.

Kawakami et al. in view of Kellerman et al. and Lee et al. does not disclose further comprising detection circuitry for detecting a curvature present in a wafer placed on said chucking pedestal.

Deguchi et al. teaches further comprising detection circuitry for detecting a curvature present in a wafer placed on said chucking pedestal (C.11 l.55 to C.12 l.14, C.4 l.28-33 & F.10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kawakami et al. in view of Kellerman et al. and Lee et al. device with the detection circuitry of Deguchi et al. since Kellerman et al. controls the pressure of the gas (temperature in the wafer) to address differences in the unevenness of the wafer, while Deguchi et al. incorporates a circuitry to sense current thru the electrodes to determine the deviation on the surface of the wafer; which means that the detection/measurement and calculation/control a posteriori results easier and more accurate by working with current values instead of temperature ones.

Regarding claim 9 Kawakami et al. in view of Kellerman et al., Lee et al. and Deguchi et al. discloses the apparatus of claim 8.

Kellerman et al. further discloses wherein said detection circuitry is configured to cause said bi-directional backside conduit to be decoupled from said backside carrier gas supply line and coupled to said vacuum supply line upon a detection of an area of contact area in said wafer (C.14 l.4-19) <sensing/detection: Deguchi et al. device and calculation/controlling: Kellerman et al. device>).

Deguchi et al. further teaches comprising detection circuitry for detecting a curvature present in a wafer placed on said chucking pedestal (C.11 l.55 to C.12 l.14, C.4 l.28-33 & F.10).

Regarding claim 10 Kawakami et al. in view of Kellerman et al., Lee et al. and Deguchi et al. discloses the apparatus of claim 9.

Kellerman et al. further discloses wherein said detection circuitry is further configured to cause said bi-directional backside conduit to be decoupled from said vacuum supply line and re-coupled to said backside carrier gas supply line upon detecting a desired pressure between said wafer and said chucking pedestal (C.14 l.4-19).

Claims 11-13 & 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kawakami et al. (US 5542559) in view of Kellerman et al. (US 7033443), Lee et al. (US 6974709) and Tong et al. (Patent Application Publication US 2004/0083975).

Regarding claim 11, Kawakami et al. in view of Kellerman et al. and Lee et al. discloses the apparatus of claim 6.

Kawakami et al. in view of Kellerman et al. and Lee et al. does not disclose comprising a suitable micro-positioning control mechanism associated with each of said inner and outer zones of said chucking pedestal, wherein a height of said inner and outer zones are independently adjustable with respect to one another

Tong et al. further discloses comprising a suitable micro-positioning control mechanism associated with each of said inner and outer zones of said chucking pedestal, wherein a height of said inner and outer zones are independently adjustable with respect to one another (Paragraph [0027] & F.6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kawakami et al. in view of Kellerman et al. and Lee et al. device with the teachings of Tong et al. to provide an easy way of mechanical adjustment according of the physical dimensions and shape of the wafer.

Regarding claim 12, Kawakami et al. in view of Kellerman et al., Lee et al. and Tong et al. discloses the apparatus of claim 11.

Tong et al. further discloses wherein said outer zone is configured to be in a raised position with respect to said inner zone when a wafer having a positive radius of curvature with respect to said chucking pedestal is placed upon said chucking pedestal (Paragraph [0028]).

Regarding claim 13 Kawakami et al. in view of Kellerman et al., Lee et al. and Tong et al. discloses the apparatus of claim 12.

Tong et al. further discloses wherein said inner zone is configured to be in a raised position with respect to said outer zone when a wafer having a negative radius of curvature with respect to said chucking pedestal is placed upon said chucking pedestal (Paragraph [0028]).

Regarding claim 13 Kawakami et al. in view of Kellerman et al., Lee et al. and Tong et al. discloses the apparatus of claim 6.

Kellerman et al. further teaches wherein said inner zone is concentrically disposed with respect to said outer zone (F.1 e.120, 122).

Claims 14-17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kellerman et al. (US 7033443) in view of Lee et al. (US 7040525) and Breitschwerdt et al. (US 6974709).

Regarding claim 14 Kellerman et al. discloses a method (a person of the ordinary skill will understand a method that is intrinsically described by the functioning of the apparatus) for implementing pressure assisted electrostatic chucking, the method comprising: placing a wafer on the pedestal (F.11A e.105), providing a backside gas (F.11A e225 <205C opened & 205B closed>), wherein the pedestal has a plurality of channels up through the top surface (C.12 l.45-48 & F.8B e.153), monitoring pressure to determine when a threshold level of chucking force exists, decoupling gas and coupling vacuum when the actual level of chucking force is less than the threshold (C.14 l.4-19).

Kellerman et al. does neither specifically disclose wherein said plurality of gas channels is configured to facilitate vacuum assisted chucking of the wafer nor that the vacuum chucking is implemented before the processing of the wafer.

Lee et al. teaches a device which applies a n electrostatic force and a vacuum force to hold a substrate to perform work on it (Abstract).

Breitschwerdt et al. teaches a method/apparatus for the processing of a semiconductor which implements a vacuum step before and after the processing of the semiconductor (C.5 l. 10-30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kellerman et al. device with the Lee et al. teachings because it allows smoother and quicker processes of a work piece (Col. 4 lines 4-8) and further with the teachings of Breitschwerdt et al. because it avoids remnants of gases/air.

Regarding claim 15 Kellerman et al. in view of Lee et al. and Breitschwerdt et al. discloses the method of claim 14.

Lee et al. further discloses comprising introducing a front side supply of gas in conjunction with said vacuum supply (F.3 e.113, 200).

Regarding claim 16 Kellerman et al. in view of Lee et al. and Breitschwerdt et al. discloses the method of claim 14.

Kellerman et al. further discloses comprising decoupling said vacuum supply from said backside of said electrostatic chucking pedestal and coupling said backside of said electrostatic chucking pedestal to said backside carrier gas whenever the actual level of chucking force meets said threshold level of chucking force (C.14 l.4-19).

Claim 17 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kellerman et al. (US 7033443) in view of Lee et al. (US 7040525), Breitschwerdt et al. (US 6974709) and Kawakami et al. (US 5542559).

Regarding claim 17 Kellerman et al. in view of Lee et al. and Breitschwerdt et al. discloses the method of claim 16 but does not specifically disclose comprising increasing an electrostatic chucking voltage applied to said electrostatic chucking pedestal whenever said coupling of said backside of said electrostatic chucking pedestal to said vacuum supply is insufficient to create said threshold level of chucking force.

Kawakami et al. further discloses further comprising increasing an electrostatic chucking voltage applied to said electrostatic chucking pedestal whenever said coupling of said backside of said electrostatic chucking pedestal to said vacuum supply is insufficient to create said threshold level of chucking force (C.3 l.50-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kellerman et al. in view of Lee et al. and Breitschwerdt et al. device with teachings of Kawakami et al. because it suppresses the generation of a residual electric charge preventing any damage or breakage of the object to be treated (C.3 l. 20-25).

Claim 17 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kellerman et al. (US 7033443) in view of Lee et al. (US 7040525), Breitschwerdt et al. (US 6974709), Kawakami et al. (US 5542559) and Katata et al. (US 6500686).

Regarding claim 18 Kellerman et al. in view of Lee et al., Breitschwerdt et al. and Kawakami et al. discloses the method of claim 17 but does not specifically disclose determining when a wafer is defective.

Katata et al. teaches an apparatus which is able to determine when the wafer is defective (C.8 l.23-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kellerman et al. in view of Lee et al., Breitschwerdt et al. and Kawakami et al. device with the defect sensor of Katata et al. because this way increases the efficiency of the electrostatic chuck by not processing defective wafers.

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis E. Román whose telephone number is (571) 272-5527. The examiner can normally be reached on Mon – Fri from 7:15 AM to 3:45 PM.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on (571) 272-2084. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.
Information regarding the status of an application may be obtained from Patent Application Information Retrieval (PAIR) system.
Status information for unpublished applications is available through private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

Luis E. Román
Patent Examiner
Art Unit 2836

LR/010508

1/7/08

MICHAEL SHERRY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800